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Coherent control of the molecular dynamics in a liquid by femtosecond four-pulse excitation

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Abstract

© 2015 Astro Ltd. The laser non-resonant excitation based on the (2 ×2) sequence of the two pairs of the pump pulses with orthogonal linear polarizations is proposed and theoretically considered for the control of the vibrational responses without or with the low amplitude of the rotational responses in a liquid. As an example, we model the optical molecular responses resulting in the optical Kerr effect transients in ortho-dichlorobenzene. Theoretical analysis shows the high efficiency of the (2 ×2) excitation scenarios for the various manipulations of the molecular responses.

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Keywords

coherent control, femtosecond spectroscopy, liquid, molecular dynamics, non-resonant excitation, optical Kerr effect, selective spectroscopy